

~~Sub added~~

- Sub a2

5 6. A method according to Claim 5, including the additional steps of:  
contacting mutant hippocampal cells having enhanced synaptic potentiation upon  
tetanic stimulation as compared to wild-type hippocampal cells with a GABA<sub>A</sub>  
receptor antagonist;  
subjecting said mutant and wild-type hippocampal cells to tetanic stimulation;  
10 and  
measuring changes in synaptic potentiation with time of the mutant and wild-type  
hippocampal cells and comparing the effect of said GABA<sub>A</sub> receptor antagonist on  
said mutant and said wild-type hippocampal cells;  
wherein a reduction in the enhanced synaptic potentiation of the mutant  
15 hippocampal cells without a significant change in the synaptic potentiation of the  
wild-type cells is indicative of the mutation acting on a common pathway with said  
GABA<sub>A</sub> receptor antagonist.

20 7. A method according to Claim 5, wherein said agent is present with said wild-  
type hippocampal cells.

25 8. A method for screening for drugs for the treatment of Alzheimer's disease,  
said method comprising:  
contacting mutant hippocampal cells having enhanced synaptic potentiation  
upon stimulation as compared to wild-type hippocampal cells with a candidate drug;  
subjecting said mutant and wild-type hippocampal cells to a tetanic stimulus  
at a first potential of glutamate currents and a second potential of GABA<sub>A</sub> currents;  
measuring the synaptic response at each of the first and second potentials for  
the mutant and wild-type hippocampal cells and comparing the effect of said agent  
30 on said mutant and said wild-type hippocampal cells;

wherein a reduction in the enhanced synaptic response of the mutant hippocampal cells without a significant change in the synaptic response of the wild-type cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

- 5 9. A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting mutant mouse hippocampal cells mutated in the presenilin-1 gene and having enhanced synaptic potentiation upon tetanic stimulation as compared to wild-type hippocampal cells with a candidate drug;

- 10 subjecting said mutant and wild-type hippocampal cells to tetanic stimulation;  
and

comparing the effect of said agent on said mutant and said wild-type hippocampal cells upon tetanic stimulation;

- wherein a reduction in the enhanced synaptic potentiation of the mutant  
15 hippocampal cells without a significant change in the synaptic potentiation of the wild-type cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

10. Slices of mouse hippocampal cells having a mutation in a presenilin gene  
20 combined with a candidate drug.

11. Slices of mouse hippocampal cells according to Claim 10, after tetanic stimulation.

- 25 12. Slices of mouse hippocampal cells according to Claim 10, wherein said mutation is the PS-1  $\Delta 9$  mutation.

Add a3

Sub  
a2  
cont